PORTABLE MARTIAL ARTS PRACTICE DUMMY

The present invention relates to a portable martial arts practice dummy and, more particularly but not exclusively, to a practice dummy for kung fu.

Prior art practice dummies for allowing martial arts enthusiasts to practice a martial art are known. One example is known as a "mok jong" dummy. (Mok jong means "wooden man" in Chinese). A mok jong dummy typically comprises a cylindrical body formed of solid wood having radial projections, also formed of solid wood. The cylindrical body is approximately the same size as an adult human. The projections correspond to arms and legs. Martial arts enthusiasts use mok jong dummies to practice and refine their technique. Prior art mok jong dummies are typically firmly secured to a wall to enable the dummy to resist forces imposed on it by a martial arts enthusiast.

Another known type of mok jong dummy is one in which the cylindrical body is attached to a metal post which in turn is attached to a base. The base is formed from a sheet of plywood. When using the practice dummy, a martial arts enthusiast stands on the base, the weight of the enthusiast firmly secures the base against a floor on which the base is supported. Thus, when the enthusiast kicks or punches the body, the body (via the attachment means) is securely held in position by the base.

SUMMARY OF INVENTION

The present invention provides several improvements over known prior art dummies.

According to one aspect of the present invention, there is provided a portable martial arts practice dummy comprising:

a body; and

support means, detachably mounted to the body, for detachably securing the body to a floor or a base and supporting the body for use, said support means comprising a plurality of members which are detachably secured to each other, the body and/or the base and wherein the body is hollow for receiving the plurality of detached members for storage.

An advantage of the invention is that the body is connected to the frame members, and the frame members are connected together. The frame members are detachable and storable in the body for easier portability. This arrangement prevents the lateral movement of the body on the assembled frame when the body is struck, without the use of external pegs or other mechanical attachments to the frame members.

In a preferred embodiment of the invention, the base is collapsible.

An advantage of the collapsible base is that it may be readily collapsed, thereby enhancing the portability of the

practice dummy. For example, the folding base may be folded and transported in the cargo portion of a hatch-back car.

Preferably the collapsible base comprises two or more panels and the two or more panels are hinged together by a hinge comprising webbing.

The use of webbing is preferable to the use of a conventional, interdigitated hinge as the webbing does not project onto a floor on which the folding base is mounted. Preferably, the webbing comprises plastic webbing such as woven nylon tape.

In another embodiment, there is provided a limb for a martial arts practice dummy, the limb (arm or leg) comprising a cylindrical shank having an end portion.

An advantage of the limb is that where it enters the body, the limb retains the maximum generally circular cross-section, minimising stress concentrations. Limbs known in the prior art change from a circular cross-section to a less substantial square cross-section where they enter the body. This change of shape can lead to undesirable stress concentrations.

The practice dummy preferably has leather punch pads.

An advantage of leather punch pads is that they are readily compatible with human skin and prevent a user of the dummy from sustaining excessive damage.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will now be described by way of example only with reference to the drawings of which:-

Fig.1 shows a practice dummy having a body, a folding base and a frame for securing the body to the folding base;

Fig. 2 shows a plan view of the folding base when laid out flat and also shows side and end views of the folding base when folded up;

Fig. 3a shows two views of a type of mounting point that is embedded at several locations within the folding base, one view is from underneath the folding base whereas the other view is a cross-section through a mounting point and the folding base;

Fig. 3b shows two views of a web hinge which connects two panels of the folding base, one view is from underneath the folding base whereas the other view is a cross-section through the web hinge and folding base;

Fig. 3c shows two views of a type of threaded anchor point which is provided at several locations on the folding base, one view is from underneath the folding base whereas the other view is a cross-section through the threaded anchor point and folding base;

Fig. 4 shows a front view and a side view of the body showing apertures through the body and also showing punching pads attached to the exterior of the body (note that the body is shown in a horizontal configuration whereas the body would be mounted in a vertical configuration when the practice dummy is being used;

Fig. 5 shows an end view of the body, the apertures through the body are shown by phantom lines;

Fig. 6 shows a plan view and two side views of an end section,. two end sections may be used to close the body (one end section being mounted at each end of the body);

Fig. 7a shows a cross-sectional view of the body, illustrating the positions of a top foam insert, a mid foam insert and a base foam insert mounted inside the body;

Fig. 7b shows a plan view and two side views of the top foam insert;

Fig. 7c shows a plan view and two side views of the mid-foam insert;

Fig. 7d shows plan view and two side views of the base foam insert;

Fig. 8 shows top, side and end views of a body internal horizontal joiner which is used to secure the body to the frame horizontals and thus to the folding base;

Fig. 9 shows the body internal horizontal joiners mounted within the body and joining two frame horizontals together within the body;

Fig. 10 shows top, side and end views of a frame horizontal;

Fig. 11 shows top, side and face views illustrating a U-bolt securing a frame horizontal to a frame upright;

Fig. 12 shows an assembled leg comprising an upper section and a lower section;

Fig. 13 shows top, side and end views of a retainer plate for the elongate nut;

Fig. 14 shows top, side and end views of the leg lower section;

Fig. 15 shows top, side and end views of the leg upper section;

Fig. 16 shows top, side and end views of a mid arm, and shows in phantom lines the body; and

Fig. 17 shows top, side and end views of an upper arm (one of two), and shows in phantom lines the body.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

GENERAL

Fig. 1 shows a folding base 100 which supports a body 110 via a frame 120. Projecting from the body 110 are upper arms 111a and 111b, a mid arm 112 and a leg 113 comprising an upper section 113a and a lower section 113b.

When using the practice dummy, a user (not shown) stands on the folding base 100 and kicks or punches the body 110. A user can also practice martial arts moves against the arms 111, 112 and the leg 113.

The folding base 100 is preferably formed of 18mm / 21mm thick plywood.

The body 110 is formed from a cylindrical plastic pipe and has a diameter of approximately 22cm and a length of approximately 1.2 metres. The body 110 is held by the frame 120 between about 15cm and 55cm clear of the folding base 100 (the height of the body above the floor being adjustable by means of the attachment to the frame). As the body 110 is formed from a (hollow) cylinder it is relatively lightweight. In contrast, prior art dummies are typically formed from a solid wooden cylinder and thus are much heavier than the body 110 shown at Fig. 1. Thus the practice dummy shown at Fig. 1 has the advantage of relatively easy portability due to the low weight of the body 110.

When the user kicks or punches the body 110, the frame 120 transfers the impact forces from the body 110 to the folding base 100. The folding base 100 is securely held against a floor (not shown) by the user's weight. The folding base 100 is not attached to the floor but rests on the floor and is pressed against the floor by the user's weight. Friction (facilitated by a non-slip underside of the folding base 100) between the folding base 100 and the floor holds the folding base 100 in place.

The body 110 shown at Fig. 1 includes a head punching pad 114 formed of leather and a belly punching pad 115 also formed of leather. The leather punching pads 114, 115 provide the advantage over prior art practice dummies of good compatibility with human skin when punched or otherwise hit by a user.

FRAME

The frame 120 is formed from round and square section extruded aluminium tubing. The frame 120 comprises an upper pair of frame horizontals 121a and a lower pair of frame horizontals 121b formed from oak or other resilient wood. The frame horizontals of the upper pair 121a meet inside the body 110 above the upper arms 111a, 111b whereas the frame horizontals of the lower pair 121b meet inside the body 110 above the leg 113. The frame horizontals 121a, 121b are securely attached to two frame uprights 122 which are mounted upstandingly from the folding base 100. As is discussed later in more detail, the frame uprights 122 have threaded projections (not shown by Fig. 1), which are removeably received by threaded inserts (not shown by Fig. 1) provided in the folding base 100.

The frame 120 also comprises a pair of rear triangulation supports 123 which provide a diagonal cross-brace for the frame uprights 122. The rear triangulation supports 123 are, from the point of view of a user of the practice dummy, behind the body 110. A pair of lateral triangulation supports 124 brace the frame uprights 122 in a direction generally perpendicular to the bracing provided by the rear triangulation supports 123. Each of the lateral translation supports 124 is connected to a respective frame upright 122 at approximately the mid-point of the respective frame upright and is joined at the other end to the folding base 100. Thus the lateral triangulation supports 124 slope downwards from the frame uprights 122 to the folding base 100.

FOLDING BASE

The frame uprights 122 extend approximately 1.6m high from the folding base 100. The frame uprights 122 are parallel and perpendicular to the base.

As shown in more detail in Fig. 2, the folding base 100 comprises five elongate panels 100a, 100b, 100c, 100d and 100e. The five panels are secured together at the rear of the folding base 100 by a rear base support 101 and at the front of the folding base 100 by a front base support 102. The rear base support 101 and front base support 102 are preferably formed from rectangular extruded aluminium tubing of external size 25mm x 50mm, having a wall thickness of 2mm. The five panels 100a-100e all lie in the same plane, one beside the other. The rear base support 101 is mounted to the folding base 100 perpendicularly to the major longitudinal axes of the panels 100a-100e so that the rear base support 101, the frame uprights 122, the frame

horizontals 121a, 121b and the rear triangulation support 123 are approximately co-planar. The front base support 102 is mounted parallel to the rear base support 101 but at the opposite end of the panels 100a-100e.

Fig. 2 also shows a side and an end view of the panels 100a-100e when folded up together. When fully expanded the folding base 100 has dimensions of approximately 1.9m between the lateral triangulation supports 124 and approximately 1.6m from the rear base support 101 to the front base support 102. When folded up, the folding base 100 has dimensions of approximately 47cm x 1.6m x 14cm. Thus compared to a non-folding base, the folding base 100 has the advantage of enhanced portability as it may be collapsed and loaded into, for example, a car for transport.

Fig. 2 shows nine mounting points CC arranged in a first line and two mounting points AA provided close to the first line. The mounting points CC are the mounting points for the rear base support 101. The mounting points AA are the mounting points for the frame uprights 122. Fig. 2 also shows nine mounting points CC arranged in a second line remote from the mounting points AA; this second line of mounting points provides mounting points for the front base support 102. A second pair of mounting points BB is provided close to the outer edges of the outermost base panels 100a and 100e. The mounting points BB are the mounting points for the lower ends of lateral triangulation supports 124.

As shown in more detail at Fig. 3a, each of the mounting points AA comprises a metal plate 320. One of the metal plates 320 is provided in a recess in panel 100a while the other metal plate is provided in a recess in panel 100e.

Each metal plate has a threaded portion 321 for receiving a threaded projection at the lower end of the frame uprights 122, and is sewed to its respective panel by screws 322.

Each of the mounting points CC that make up the first and second lines comprises a threaded metal anchor 350 mounted in respective recesses on the underside of the folding base 100. The use of recessed anchors 350 avoids projections on the underside of the folding base 100, which could scratch or otherwise damage the floor.

Fig. 2 also shows two mounting points BB, one in panel 100a and the other in panel 100e. The mounting points BB are similar to the mounting points AA and are respectively connected to the lateral triangulation supports 124. The mounting points BB are not shown in detail.

BASE PANEL HINGES

Fig. 2 also shows an end-on view of the folding base 100 when laid out flat. As can be seen, the five panels 100a-100e are joined together by four web hinges DD.

The web hinges DD are shown in more detail by Fig. 3b. Fig. 3b shows a view of a web hinge DD looking upwards from underneath the folding base 100 and also shows an illustrating cross-sectional view of a web hinge DD. Each web hinge DD comprises a respective web 300. The web 300 is preferably formed from woven nylon tape having a thickness of 1mm, a width of 50mm and a length of 1600mm, i.e. the same length as the panels 100a-100e. Two metal / strong plastic strips 301, one on either side of the hinge joint, secure the nylon web 300 to respective edges of the panels. A plurality of screws 302 fasten the metal strips 301 and

pass into and through the nylon web 300, thus securely attaching the nylon web 300 to the panels 100a-100e on either side of the hinge joint.

An advantage of using a nylon web instead of a conventional interdigitated hinge is that no portion of the hinge projects beyond either the top surface of the folding base 100 or the bottom surface thereof. An advantage of a folding base 100 with no projections is that the folding base 100 will not scratch a floor upon which it is resting, nor are there any projections which could injure a user's foot.

BODY

Fig. 4 shows two views, a front view and a side view, of the body 110. Note that when in use the body 110 is mounted vertically whereas in Fig. 4 the body 110 is shown in a horizontal position. Fig. 5 shows an end view of the body 110.

MID ARM

The way in which the mid arm 112 is mounted to the body 110 will now be discussed with reference to Figs. 1, 4, 5 and 16.

Fig. 16 shows a top view, a side view and end views of the mid arm 112. The top view shows that the mid arm 112 has two ends, end A and end B. End B is frustoconical and, when the mid-arm 112 is mounted to the body 110 for use, stands out of the body 110 and projects towards the user of the practice dummy. The mid arm 112 has a diameter of about 45mm but tapers towards end B and has a diameter of about 38mm at end B. The mid arm 112 is formed from solid wood, preferably

a hardwood. End A of the mid arm 112 has an approximately rectangular cross-section as shown by the end view of end A.

The mid arm 112 has a length of approximately 55cm. End A is provided with a tapered hole 1600 into which a retaining peg (not shown) may be fitted. Superimposed on the top view in phantom lines are the inner and outer cylindrical surfaces of the body 110. The outer cylindrical surface of the body 110 is represented by phantom circle 1610 whereas the inner cylindrical surface of the body 110 is represented by the phantom circle 1611.

Where the rectangular end A meets the circular portion of the mid arm 112, the mid arm 112 has a pair of curved portions 1601 which have the same radius of curvature as the interior of the body 110. Where the mid-arm 112 is mounted to the body 110, the curved portion 1601 abuts against the interior of the body 110. A retaining peg (not shown) is inserted into the tapered hole 1600 so that the retaining peg prevents the removal of the arm from the body 110 when pulled. The mid arm 112 has a cylindrical axis 1620.

MID ARM FIXING

Returning to Figs. 4 and 5, the front of the body 110 has an aperture C of approximately 50mm diameter and the rear of the body 110 has a substantially rectangular aperture C'. The aperture C supports the mid arm 112 intermediate between ends A and B, whereas aperture C' receives the substantially rectangular end A of the mid arm 112. Thus when the mid arm 112 is mounted to the body 110, the axis 1620 of the mid arm 112 lies along the diagonal line 500 shown by Fig. 5. The diagonal line 500 connects the mid-points of the apertures C and C'.

UPPER ARMS AND FIXING

The upper arms 111a, 111b are similar to the mid-arm 112 and will not be discussed in detail. The upper arms 111 each have a tapered hole 1700, a cylindrical axis 1720 and a single curved portion 1701. For each of the upper arms 111a, 111b, the curved portion 1701 has the same radius of curvature as the interior of the body 110. A difference between the upper arms 111 and the mid-arm 112 is that each of the upper arms 111 has only a single curved portion 1701.

As with the mid-arm 112, the upper arms 111 have a generally rectangular end A and a circular, generally frustoconial, end B towards which the upper-arms 111 taper slightly.

As can be seen by comparing the top and side views of the upper arms 111 with the top and side views of the mid-arm 112, the generally rectangular end A meets the circular portion of the upper arm 111 at two different locations along the cylindrical axis 1720. On one face of the generally rectangular end A, the generally rectangular end A meets the circular portion of the upper arm 111 at the curved portion 1701. On the other face of the generally rectangular end A the rectangular profile is extended and meets the circular portion of the upper arm 111 at an angled face 1750. As can be seen from the top view of Fig. 17, the angled face 1750 is at an angle of α to the cylindrical axis 1720. In this embodiment α is 30°. Whereas the curved portion 1701 is in the proximity of end A, the angled face 1750 is approximately equidistant between ends A and B of the upper arms 111.

In other words, compared to Fig. 16 a portion 1770 has been removed from the upper arms 111. The reason why portion 1770 is removed from upper arms 111 becomes apparent by reference to Figs. 1 and 4. As can be seen, the upper arms 111a, 111b are mounted at approximately the same height to the body 110. When mounted to the body 110, the respective cylindrical axes 1720 of the upper arms 111 are separated in a vertical direction along the body 110 by a distance that is less than the diameter of the upper arms 111. Thus without the removal of the portions 1770 from the upper arms 111, the upper arms 111 would obstruct each other. Fig. 5 shows two diagonal lines 510a and 510b. Diagonal line 510a connects a circular aperture D at the front of the body 110 to the centre of a generally rectangular aperture D' at the rear of the body 110. Diagonal line 510b connects the centre of a circular aperture E at the front of the body 110 to the centre of a generally rectangular aperture E' at the rear of the body 110. When the upper arm 111a is mounted to the body 110, the cylindrical axis 1720 of the upper arm 111a lies along the diagonal line 510a. When the upper arm 111b is mounted to the body 110, the cylindrical axis 1720 of the upper arm 111b lies along the diagonal line 510b.

END SECTIONS

Fig. 6 shows one of two end sections 600. As shown by Fig. 1, each end section 600 may be placed at a respective end of the body 110 to close the cylindrical tube from which the body 110 is formed. The end sections 600 are discoidal having a diameter of approximately 20cm and a thickness of approximately 3cm. Fig. 6 shows a plan view of an end section together with side and end views thereof. As can be seen, the end section 600 is discoidal and has two pins G at one end and a spring-loaded plunger H at the other end. The

end sections 600 are each provided with a pair of steel pins G which can be received by a pair of corresponding apertures F' (shown at Fig. 5) at the top and bottom ends of the body 110. The diameter of the end sections 600 is approximately 20cm which is slightly less than the inner diameter of the body 110, shown at Figs. 5 and 16 by the circle 1611.

Each end section 600 is provided with a pair of steel pins G at one end and with a spring-loaded plunger H at the other end. The body 110 has a pair of apertures F' at the top and bottom of the rear for receiving the pins G. The top and bottom of the front of the body 110 are also provided with apertures F for receiving the plunger H. A spring I urges the plunger H outwards. A retaining screw J limits the range of the plunger in its hole.

To mount an end section 600 to the body 110, the end section 600 is first positioned so that the pins G engage the apertures F' in the body 110, whilst pushing the plunger H so that it no longer projects from the end section 600 and allowing the end section 600 to drop to its mounted position. When the plunger H is aligned with the aperture F, plunger H projects outwards from the end section 600 by the force of the spring I, and engages with the aperture F. Removal of the end section 600 is the opposite of the mounting procedure above. By pushing the plunger H inward so that it no longer projects from the end section 600, and using an upward motion, the plunger H no longer engages with the aperture F. The upward motion allows the end section 600 to be lifted off as the plunger H projects outwards from the end section 600 by the force of the spring I, and prevents it from settling back to its mounted position.

Fig. 7a shows a cross-sectional view of the body 110 and illustrates the position of a top foam insert 701, a mid foam insert 702 and base foam insert 703 inside the tubular body 110. The foam inserts 701, 702 and 703 allow the upper arms 110, the mid arm 112, the leg 113 and frame horizontals 121 to be mounted within the body 110. Mounting these parts within the body 110 protects the parts from damage and also enhances the portability of the practice dummy as the parts can be stowed inside the body 110, thus taking advantage of what would otherwise be an empty volume.

Each foam insert 701, 702 and 703 is discoidal having a diameter of approximately 20cm and a thickness of approximately 5cm. The top and base foam inserts 701 and 703 are provided with holes A, B, C, which extend 4cm deep into the 5cm thickness of the inserts. Mid foam insert 702 is provided with apertures A, B, B', C and D.

As can be seen from Figs. 7b, 7c and 7d, there are three holes A of diameter 45mm in the top foam insert 701, three apertures A of diameter 45mm in the mid foam inserts 702 and three holes A' of 40mm diameter in the base foam insert 703. When the foam inserts 701, 702 and 703 are aligned in the body 110 then three longitude sets of holes and apertures A and A' are provided parallel to the longitudal access of the body 110. Each of the three sets can be used to store one of the three arms, that is one of the two upper arms 111a, 111b and mid arm 112. The holes A' in the base section 703 have a diameter of 40mm rather than 45mm due to the tapered form of the arms.

Figs. 7b, 7c and 7d also show a set of apertures for holding the upper leg 113a and another set of apertures for

holding the lower leg 113b. These will now be discussed in more detail with reference to Fig. 12, 14 and 15. The upper leg section 113a has a longer length than the lower leg section 113b. Thus the upper leg section is held by aperture B in the foam insert 701 and aperture B in the mid foam insert 702 and aperture B in the base foam insert 703. The lower leg section 113b is held by aperture B in the top foam insert 701 and an aperture comprising a hole B' and a hole D (to accommodate the threaded protrusion); there is no corresponding hole in the base foam insert 703.

Finally, the holes and apertures C in the foam inserts of 701, 702 and 703 allow the frame horizontals 121 to be stored. The holes and apertures C are rectangular and thus allow the four members (which together make up the upper pair of frame horizontals 121a and the lower pair 121b to be stored parallel with each other.

Note that in this embodiment of the practice dummy the arms 111 and 112 have approximately the same length as the members that make up the frame horizontals 121. This provides the advantage that three foam inserts 701, 702, 703 can be used to hold all the parts which are to be stowed within body 110.

BODY INTERNAL HORIZONTAL JOINER

Fig. 8 shows one of two body internal horizontal joiners 800. Two joiners 800 are used in the practice dummy. One joiner 800 joins together the two members 1000 (discussed in relation to Fig. 10) that make up the upper pair of frame horizontals 121a. The other joiner 800 joins the members of the lower pair of frame horizontals 121b. The joiners 800 also have the function of fixing the body

110 relative to the frame horizontals 121 so that the body 110 cannot slide along the frame horizontals 121. Fig. 9 shows a body internal horizontal joiner 800 mounted within the body 110 and being used to join a pair of frame horizontals 121 together and thereby securing the body 110 to the frame horizontals 121.

As can be seen from Fig. 8, the body internal horizontal joiner 800 is formed from rectangular box section, in this case aluminium. The two ends 801 of the joiner 800 are angled inwards by, in this embodiment, 30°.

Fig. 9 shows that each of the angled ends 801 lies substantially flush against the interior of the body 110 (shown by the phantom circular line 1611 which corresponds to that shown at Figs. 5, 16 and 17) when the joiner 800 is suitably in position. Returning momentarily to Fig. 4, there are shown in phantom lines for the front view, and in solid lines for the side view, four rectangular apertures A through which the frame horizontals 121 may be inserted into the body 110.

Fig. 9 shows that the ends of the pair of frame horizontals 121 meet in a plane PP' which bisects the body internal horizontal joiner 800. The joiner 800 is provided with a pair of apertures 810 through which a pair of wing bolts 900 may be inserted, a respective wing bolt 900 being inserted into each of the two members making up a pair of frame horizontals 121.

The use of a body internal horizontal joiner 800 allows frame horizontals 121 having a relatively short length to be used; if the joiners 800 were not used then instead of using

four frame horizontals members of length 60cm each, two members each of length 120cm would be required. Relatively short frame horizontals provide the advantage of enhanced portability.

FRAME HORIZONTAL MEMBERS

Fig. 10 shows a frame horizontal member 1000. The practice dummy has a total of four identical frame horizontal members 1000. Two members 1000 make up the upper pair 121a of frame horizontal members, two more members 1000 make up the lower pair 121b of frame horizontal members. Fig. 10 shows top, side and end views of member 1000.

In this embodiment, the member 1000 has a length of 60cm, a thickness of 2cm and a width of 4.5cm. At one end of the member 1000 there is a semi-circular channel 1001, which is provided for receiving a U-bolt. At the other end of the member 1000 there is provided a threaded steel insert 1002 for receiving a wing bolt 900. At the same end there is provided a camber which is used as a key to orient the frame member in the joiner. In this embodiment the members 1000 are formed from a resilient wood, such as oak.

ATTACHMENT OF MEMBERS TO THE FRAME UPRIGHT

Fig. 11 shows how the members 1000 are secured to the frame upright 122. Fig. 11 shows two views, one looking head-on at frame upright 122, the other looking side-on (and thus end-on at the same frame upright 122). As shown, a U-bolt 1100 is received by a channel 1001 and passes through the frame upright 122 where the U-bolt 1100 is secured by a pair of wing nuts 1101.

An advantage of the channel is that it prevents the frame horizontals from moving relative to the frame uprights during use.

LEG

Fig. 12 shows the way in which the lower leg 113b joins the upper leg 113a. A bolt 1200 captively embedded within the lower leg 113b is received by an elongate nut 1201 which is captively held in the upper leg 113a by a retainer plate 1202. The retainer plate 1202 is mounted in a recess provided on the upper leg 113a and is held by four screws 1203. The elongate nut 1201 is received by a hexagonal recess 1204 provided in the upper leg 113a.

As can be seen, when the leg 113 is assembled the lower leg 113b fits flush against the retainer plate 1202 of the upper leg 113a. To assemble the leg 113, the bolt 1200 is coupled with the elongate nut 1201 and the lower leg 113b is rotated relative to the upper leg 113a until the lower leg 113a bears against the retainer plate 1202.

RETAINER PLATE

Fig. 13 shows top, bottom and side views of the retainer plate 1202. As shown, the retainer plate 1202 has a central aperture 1300 which allows the bolt 1200 to pass therethrough. The retainer plate also has four screw apertures 1301 which allow the screws 1203 to pass through the retainer plate 1202 and into the upper leg section 113a. On one face of the retainer 1202, the screw apertures 1301 are counter sunk so that the heads of the screws 1203 are flush with the surface of the retainer plate 1202.

LOWER LEG

Fig. 14 shows an end and two orthogonal side views of the lower leg 113b. The lower leg 113b has a length of about 30cm and a diameter of about 75mm. A threaded region of the bolt 1200 projects about 40mm from one end of the leg 113b. The bolt 1200 has a head 1400, which is recessed towards the centre of the lower leg 113b. A cylindrical recess 1405 is provided in the lower leg 113b to receive the bolt 1200. To assemble the bolt 1200 and leg 113b, the cylindrical recess 1405 is drilled into the leg 113b and the bolt 1200 is inserted, head 1400 first, into the hole. The hole is then back-filled with epoxy resin 1402 so that the bolt 1200 is firmly embedded and anchored to the lower leg 113b. In this embodiment the bolt 1200 is a metric M12 bolt having a length of 120mm.

In this embodiment, torsional motion of the bolt 1200 relative to the lower leg 113b is substantially prevented by a steel pin 1401, which passes diametrically through the lower leg 113b and also diametrically through the bolt 1200. The steel pin 1401 has a diameter of 3mm and a length of 60mm. A hole for the steel 1401 can either be drilled into the bolt 1200 before the bolt 1200 is mounted into the lower leg 113b or after the bolt 1200 has been embedded in the lower leg 113b.

UPPER LEG

Fig. 15 shows end, side and top views of the upper leg 113a. The upper leg 113a has two ends, end A and end B. End A is generally rectangular and is provided with a tapered hole 1500. When the upper leg 113a is secured within the body 110, end A first passes through the front of the body 110, then through the rear of the body 110 and a retaining peg (not shown) is inserted into the tapered hole

1500 and abuts to the outer rear surface of the body thus preventing motion. When mounted thus, end B of the upper leg 113a projects out from the front of the body 110.

The retainer plate 1202, the hexagonal recess 1204 and elongate nut 1201 are provided at end B. As shown, at end B the upper leg 113a terminates in a plane which intersects the longitudinal axis 1520 at an angle of 35°. The outer surface of the retainer plate 1202 lies in the same plane.

The upper leg 113a has a diameter of about 7.5cm and a length of about 58cm.

The upper leg 113a is cylindrical apart from the generally rectangular end A. Where the generally rectangular end A meets the cylindrical body of the upper leg 113a, there are defined a pair of shoulders 1505. The shoulders 1505 are co-planer; the plane intersects the longitudinal axis 1520 at an angle of 10°. Referring momentarily to Fig. 4, the cylindrical portion of the upper leg 113a is received by aperture B at the front of the body 110 and the generally rectangular end A is received in the aperture B' at the rear of the body 110. The apertures B and B' are offset axially along the body 110 so that when the upper leg 113a is mounted to the body 110, the longitudinal axis 1520 of the upper leg 113a slopes down at an angle of 10° towards the feet of a user.

ALTERNATIVE EMBODIMENTS

Various modifications may be made to the practice dummy illustrated at Figs. 1 to 17.

In one alternative, instead of using a frame 120 to secure the body 110 to the folding base 100, a metal post may be used. The body 110 is secured to the metal post and the metal post, in turn, secured to the folding base 100. Preferably, the metal post has a foot so that impact forces transmitted from the body 110 to the metal post can be spread over the area of the foot. Preferably, four fastenings, for example, bolts, are used to secure the foot to the folding base 100. In another alternative, two posts are used and four frame horizontal members 1000 are secured to the two posts in order to support the body 110.

In another alternative embodiment, instead of a folding base 100, the base is a single sheet of plywood. A single sheet of plywood has the advantage of reduced cost and easier fabrication. Of course, such a non-folding base has a disadvantage that it cannot be so readily transported (considering the substantial size required for proper execution of the various exercises prescribed for kung fu).

In another embodiment, a base 100 is not used. Instead, , a floor having suitable mounting points (for example the floor of a gym which has been modified by the addition of suitable mounting points) is used and the frame 120 connects the body 110 to the floor.

The leg 113 was described as being made up of a lower part 113b and an upper part 113a. In an alternative embodiment, a unitary leg is used instead. Such a unitary leg offers the advantage of reduced manufacturing costs but suffers from a disadvantage that it cannot be dissembled and is therefore not as readily transportable as the leg 113 described earlier.

The upper arms 111a, 111b, the mid arm 112 and the leg 113 were each described as having a generally rectangular end for engagement into a corresponding rectangular aperture at the rear of the body 110. Correspondingly, the front of the body 110 had generally circular (or in the case of the leg 113, circular but drilled at an angle not perpendicular to the body, due to the inclination of the leg 113) mounting apertures. The portions of the upper arms 111, mid arm 112 and leg 113 that pass diametrically through the body 110 had a cylindrical shape. In an alternative embodiment, one or more of the upper arms 111, mid arm 112 and leg 113 may be mounted to the body 110 using generally rectangular apertures at both the front and rear of the body 110. However, it is preferred that the arms 110, 112 and 113 retain a generally cylindrical shape as they enter the body 110 in order to maximise their strength. In the embodiment described above, the transition between the generally cylindrical shape and generally rectangular shape occurred at the rear of the body 110. A disadvantage of the transition occurring at the front of the body 110 is that, due to the transition, stress resulting from impact forces will be increased, thereby detrimentally increasing the risk that the arms 111, 112 or leg 113, will fracture or be otherwise damaged during use. In the case of the arms 111, 112, another advantage of a generally cylindrical shape, both protruding from the body 110 and extending diametrically through the body 110, is that circular apertures (which are easier to machine than generally rectangular apertures) are required at the front of the body 110.

The arms 111, 112 and leg 113 were described in conjunction with a portable martial arts practice dummy. In alternative embodiments, the arms 111, 112 and/or the leg 113 may be used in conjunction with conventional, non-portable practice dummies.